Official Journal of the Animal Science and Production Association (ASPA)

ISSN 1594-4077
eISSN 1828-051X

www.aspajournal.it

Italian Journal of Animal Science
2015; volume 14
supplement 1

italian journal of animal science

ASPA 21st Congress

Milano, June 9-12, 2015

Book of Abstracts

Guest Editor: Giovanni Savoini

C-038

Sustainability of conventional and organic dairy farms in mountain areas

Sara Salvador, Anna Zuliani, Mirco Corazzin, Edi Piasentier, Alberto Romanzin, Stefano Bovolenta

Dipartimento di Scienze Agrarie e Ambientali, Università degli Studi di Udine, Italy
Corresponding author: sara.salvador@uniud.it

Traditional and organic mountain farms appear unsustainable from an environmental point of view when emissions are allocated only on the quantity of milk produced. However, mountain farms deliver to the community also co-products and ecosystem services (ES) that need to be taken in to account. Animal welfare could be considered an additional service provided by mountain farming systems to urban consumers through more ethical foods. The aim of this work is a multicriteria evaluation of 16 transhumant alpine dairy farms, 8 organic (ORG) and 8 conventional (CON). Different functional units and allocations were considered in a Life Cycle Assessment (LCA). In particular on-farm emissions were allocated on the co-product meat and on ES performing an economic allocation on the basis of agri-environment payments: the services recognized and paid to the farms object of this study were the maintenance of local breed (Rendena) and the management of pastures. In addition Welfare Quality® assessment protocol and Animal Needs Index score (ANI 35L) were used to score dairy cow welfare. Comparing ORG and CON farms for kg of Fat and Protein Corrected Milk (FPCM), emissions were always higher for the ORG, although only the difference concerning the warming potential (1.03 *vs.* 0.92 kg CO_2 eq) was statistically significant. Effects on acidification (17.42 g SO_2 eq/kg FPCM) was higher than the most intensive farms of the plain, while effects on eutrophication (2.43 g PO43- eq/kg FPCM), was instead rather low. However, when the environmental burden is allocated also on meat and ES, greenhouse gas emissions attributed to milk are reduced by 34% (0.75 kg CO_2 eq/kg FPCM). When considering welfare, all farms resulted in 2 welfare categories (acceptable and enhanced) according to the Welfare Quality®. Similarly, according to the ANI 35L score, medium-high values were recorded (25.8 and 26.9 for ORG and CON respectively). The findings of the survey show that welfare scores are flatten to medium values even when different management practices, housing systems, herd sizes are taken into consideration. The capability of LCA and welfare assessment to capture the beneficial effects of multifunctional mountain farms is limited. Agreed and integrated methodologies are needed in order to properly assess environmental sustainability of mountain farms.

C-039

Green house gas emissions in the production of heavy pig

Anna Sandrucci, Maddalena Zucali, Alberto Tamburini, Luciana Bava

Dipartimento di Scienze Agrarie e Ambientali, Università degli Studi di Milano, Italy
Corresponding author: anna.sandrucci@unimi.it

Meat is one of the food products with the biggest impact on the environment. This is a consequence of the low efficiency of the animals in converting feed into meat, as a large part of the energy ingested is necessary for maintenance or lost as excretions and emissions. Italian pig production is characterized by a very high slaughtering weight in comparison with European standards: a minimum of 9 months age and an average final live weight of about 160 kg are requested to comply with the rules of the Consortia for the production of Parma and San Daniele dry-cured PDO hams. Advancing livestock age and increasing fat deposition negatively affect feed conversion ratio, which is one of the main determinants of meat production environmental impact. Only few studies analysed the global warming potential of pork meat production, while none focused on the production of heavy pigs. A cradle to farm gate Life Cycle Assessment was performed to evaluate the greenhouse gas emission of meat production of heavy pigs in 6 farms located in the Po valley. Key parameters concerning on-farm activities (feed production, fuel and electricity consumptions, manure and livestock management), off-farm activities (production of fertilizers, pesticides, purchased feed, replacement animals, electricity, fuel) and transportation were collected through personal interviews to the farmers to calculate the related emissions. The functional unit was 1 kg of live weight leaving the farm gate. Among the six swine farms, four were farrow-to-finish while two were grow-to-finish farms. Moreover, two of the 6 farms were very large (more than 15,000 heavy pigs sold yearly) while the other four were small (less than 5,000 heavy pigs/year). The average slaughtering weight was 168.7 kg (±33.3). The global warming potential per kg live weight was on average 4.25 kg CO_2 eq from a minimum of 2.69 to a maximum of 5.81, consistent with the results of previous studies carried out on lighter pigs. The major contributor to the emission of greenhouse gases was represented by purchased feed (58.1±10.5%); enteric and manure emissions from housing and storage loaded for the 17%. On one of the closed cycle farms the contributions of the different stages of reproduction, rearing and fattening were calculated. The phase of heavy pig from 100 kg to slaughtering had the biggest impact, with a contribution of 27.5% to global warming potential per kg of live weight.